



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,408	09/25/2003	Xiaolan Ai	TIMK 8497US	5738

1688 7590 06/23/2005

POLSTER, LIEDER, WOODRUFF & LUCCHESI
12412 POWERSCOURT DRIVE SUITE 200
ST. LOUIS, MO 63131-3615

EXAMINER

LE, DAVID D

ART UNIT PAPER NUMBER

3681

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Interview Summary

Application No.

10/670,408

Applicant(s)

AI, XIAOLAN

Examiner

David D. Le

Art Unit

3681

All participants (applicant, applicant's representative, PTO personnel):

(1) David D. Le. (3) _____

(2) Scott A. Smith. (4) _____

Date of Interview: 21 June 2005.

Type: a) ☒ Telephonic b) ☐ Video Conference
c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.
If Yes, brief description: _____

Claim(s) discussed: 2.

Identification of prior art discussed: US Patent No. 5,688,201 to Zhou and US Patent No. 3,945,270 to Nelson et al..

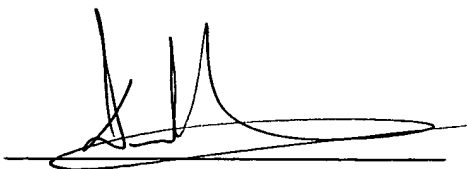
Agreement with respect to the claims f) ☐ was reached. g) ☒ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The proposed claims 1 and 8 do not appear to overcome the above applied references.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.


Examiner's signature, if required

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Polster, Lieder, Woodruff & Lucchesi
12412 Powerscourt Drive, Suite 200
St. Louis, MO 63131-3615

Telephone (314) 238-2400

Fax (314) 238-2401

Fax Memo

To: David Le
Company: USPTO
Fax No.: 571-273-7092
From: Scott A. Smith
Date: 06/21/05
Subject: 10/670,408
Number of Pages Sent: 3

David,

Please see the attached Proposed amendments to the claims. I will address the substance of these changes during our phone interview today.

Thank you,

Scott A. Smith

The documents accompanying this transmission contain information from the law offices of Polster, Lieder, Woodruff & Lucchesi. The information is CONFIDENTIAL and/or legally privileged. The information is intended only for the use of the individual or entity named on this transmission sheet. If you are not the intended recipient, any disclosure, copying, distribution or the taking of any action in reliance on the contents of this facsimile information is strictly prohibited. The documents should be returned to this firm immediately. If you have received this facsimile in error, please notify us by telephone immediately so that we can arrange for the return of the original documents to us at no cost to you.

PROPOSED CLAIMS

WHAT I CLAIM IS:

1. (Currently Amended) A wedge loading mechanism for an eccentric planetary traction drive comprising a roller positioned between and in frictional contact with two raceways that form a circumferential convergent wedge such as to communicate motion between the two raceways, wherein the roller includes a flexible mounting that generates a difference between an effective supporting stiffness K_S of the roller and an effective contact stiffness K_R at a contact point A where the roller contacts at one of the two raceways and at a contact point B where the roller contacts the other of the two raceways.

2. (Previously presented) The wedge loading mechanism of Claim 1, the roller comprising a loading roller ring and wherein the flexible mounting comprises a supporting shaft, an elastic insert, and a bearing.

3. (Previously presented) The wedge loading mechanism of Claim 2 where, as the loading roller ring is driven by friction forces F at contact points A and B into a converged wedge between the two raceways, a normal contact force N and a supporting force F_0 are characterized by:

$$F_0 = K_S \cdot l$$

$$N = K_R \cdot l \sin \frac{\delta^*}{2} = K_R \int_0^l \sin \frac{\delta}{2} dl$$

where l is the distance that the center of loading roller ring moves within the converged wedge in response to the friction forces at contact points A and B, and δ is the wedge angle between the two raceways measured at the contact points.

4. (Original) The wedge loading mechanism of Claim 3 where an operating friction coefficient at a contact is μ_0 and a supporting force under static equilibrium conditions is characterized by:

$$\frac{F_0}{2N} = \mu_0 \cdot \cos \frac{\delta}{2} - \sin \frac{\delta}{2}$$

5. (Original) The wedge loading mechanism of Claim 4 wherein under static equilibrium conditions an effective stiffness ratio between K_S and K_R as characterized by:

$$\frac{K_S}{K_R} = 2 \left(\mu_0 \cos \frac{\delta}{2} - \sin \frac{\delta}{2} \right) \sin \frac{\delta^*}{2} \leq \mu \sin \delta - 2 \sin^2 \left(\frac{\delta}{2} \right)$$

where μ is the maximum available friction coefficient at the contacts.

6. (Original) The wedge loading mechanism of Claim 5 where in the situation where the stiffness ratio has a negative value, there is a direction change in the force F_0 indicating the supporting shaft is pushing the loading roller ring into the converged wedge.

7. (Original) The wedge loading mechanism of Claim 6 wherein wedge loading mechanism incorporated into the planetary traction drive can be operated under any small wedge angle δ while still having the traction drive being operated at or close to the maximum available friction coefficient μ so long as the stiffness ratio is appropriately chosen, as characterized by:

$$\frac{K_S}{K_R} = 2 \left(\mu_0 \cos \frac{\delta}{2} - \sin \frac{\delta}{2} \right) \sin \frac{\delta^*}{2} \leq \mu \sin \delta - 2 \sin^2 \left(\frac{\delta}{2} \right)$$

8. (Currently amended) A wedge loading mechanism for a planetary traction drive comprising a planetary roller positioned between and in frictional contact with an outer ring member and a sun roller member eccentric to the outer ring member of the planetary traction drive that form a circumferential converged wedge such as to communicate rotational motion between the outer ring member and the sun roller member, wherein the planetary roller includes means for flexibly mounting a support shaft within the planetary roller such that said means generates an effective supporting stiffness K_S of the planetary roller and an effective contact stiffness K_R at a contact point A where the planetary roller contacts the sun roller member and at a contact point B where the planetary roller contacts the outer ring member, wherein a chosen ratio of K_S to K_R results in a more efficient transmission of power and torque between the two raceways than other ratios of K_S to K_R .

9. (Previously presented) The wedge loading mechanism of Claim 8 wherein said means for flexibly mounting a support shaft within the planetary roller comprises a elastic insert and a bearing, wherein the supporting shaft is located in the elastic insert and the elastic insert is located in the bearing.

10. (Currently amended) A method of transmitting rotational motion and torque within a traction drive device comprising the steps of:

manufacturing a wedge loading mechanism having a flexibly mounted
supporting shaft;

installing the wedge loading mechanism into a traction device having a

sun roller member into an outer ring member such that the sun roller member is eccentric to the outer ring member and a circumferential wedge gap is formed between the sun roller member and the outer ring member and the wedge loading mechanism is located within the wedge gap;

installing a planetary roller member into the wedge gap such that the planetary roller member is between and in contact with the sun roller member and the outer ring member; and

wedging the wedge loading mechanism between the outer ring member and the sun roller member by rotation of at least one of either the sun roller member or the outer ring member such that rotation and torque is transmitted from the outer ring member and the sun roller member.